into two separate realms: the human world, comprising villages and gardens, and the wild world, *ariri*, the bush, where everything is dangerous and inimical to man, and where the ghosts (*sovai*) have their abode. The area friendly to man is thus reduced to a small space, whereas the area hostile to man is an infinite expanse. Thus man is forever at strife with all but a small circumscribed portion of the universe. The myth of pig-man restates in another idiom the message of the primal theft of the piece of string.

3. *Domestication of Pigs: Husbandry*

Separate though the worlds of bush and human habitation may be, Orokaiva still view them as linked by an exchange relationship. One side of this transaction has already been described in detail by Williams (1930:267ff.). A man becomes a *sovai* at death. As such he enters into various animals. An important class of *sovai* (though not all *sovai*) can be recognised by the abnormal appearance or behaviour of the animals into which they have entered. They are greatly feared and are thought responsible for a great variety of misfortunes. Thus if a man fears the supernatural dangers of the bush, he does not regard these as generated by anything inherent in nature, but as introduced by dead hunters and killers who retain their human wilfulness while deprived of human bonds.

In certain special circumstances bush creatures may re-enter the protected confines of human society. The most important example of such a reverse transaction between bush and village is furnished by the domestication of pigs. There is, of course, no zoological difference between wild and domestic pigs, both being scientifically known as *sus papuensis* and known in the vernacular as *o ohu*. The myths explaining the domestication of pigs are all very simple. In one of them the first pig ever killed by man was a sow marauding the taro gardens. After killing her, men heard a mournful song by the root of a tree. It was sung by her piglets who were thirsting for their mother's milk. The piglets were taken to the village and became the first domestic pigs. The piglets' song, of course, is still known.

The breed has continued until today, being constantly replenished by foundlings from the bush. As boars are castrated, sows mate in the bush. In the bush around Sivepe some wild boars must still exist, though these are probably the offspring of tame sows who have escaped to the bush.

The domestication of piglets is a complicated task which I once saw performed at Inonda. When a piglet was found in the bush it was given for rearing to an old woman who was an expert at domestication. She made a medicine by chewing together betelnut, *hingi* (a peppery leaf) and *arifa* root (in Sivepe *akore* root would have been used). She spat this medicine into all body apertures: mouth, eyes, ears, nose, rectum, genitals. A few hours later she carried the piglet to a creek, washed it and placed it in a string bag (*eti*) in the same way as a baby. Five days afterwards, the piglet could be seen walking through the village on a leash, held by its 'mother'. After two or three weeks, it was regarded as domesticated.

The medicine was intended to seal the piglet from *sovai* who might otherwise enter it. As a bush animal, the piglet was considered impure, dangerous, and liable to spirit entry. The Orokaiva believe that it is *sovai* contamination which

241 rodent attack. A hardwood planting stick (ti) is used to loosen the soil, though occasionally shovels are used to make mounds for sweet potato runners and tubers, or for yams. Sugar cane and pitpit are planted either in clumps of suckers or in lengths or 3 nodes but bananas are propagated only from suckers.

Maize, cucurbits and tobacco are planted before or with the main crop of taro. They usually grow best near stumps or logs, perhaps because they benefit from extra potash and humus.[1] Tobacco seeds are thrown near stumps and when seedlings are about 6 inches high they are transplanted throughout the garden. Numerous varieties of taro (Colocasia spp.), distinguished by their colour and stem and leaf shape, are propagated by suckers. The suckers are placed in holes 6-8 inches deep and spaced about 2 feet apart. A small amount of Xanthosoma taro is planted, usually on sloping ground, and not necessarily in the main gardens. Yams are planted in separate areas if planting material is plentiful. Otherwise they are planted at random through the garden. Two common varieties are recognized.

Sweet potato is grown only in small quantities as a supplementary diet to the taro. If it is planted among the taro, the planting is delayed until the taro is suckering. Small plots are often made in a taro garden after most of the taro has been extracted. Minor crops found in the gardens are cabbage, manioc, beans, tomatoes, ginger, shallots, pineapple and pawpaws. (Table 1.)

Gardens are usually weeded 3 times. Weed infestation becomes too heavy to handle at this stage, but crops are mature enough to compete successfully and shade from the weeds is claimed to benefit the taro.

417 Fencing is not as extensive or elaborate as in many Orokaiva areas, due to a scarcity of wild pigs. Gardens are usually made on sites at a distance from the village which is considered too [136] far for domestic pigs to wander. Despite this precaution, 2 men had their gardens spoiled by village pigs just before our visit.

Fences are raised to a height of about 4 feet by piling logs horizontally on a broad base and securing them with perpendicular stakes. In most cases the fence is erected only on the garden border which is considered most accessible to pigs. This is often done after the area has been planted. The barrier may be extended later if another side is found to need protection.

[241] [476] A virtual absence of wild pigs is partly responsible for the tendency for the gardens to be scattered. In other parts of

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[1] Cf. Vicary 1960:188.

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311 standards of subsistence agriculture.[1] Their own property totals 138 acres.

c. Hunting and fishing

224 These pursuits add variety ot the diet but provide comparatively
[136] little food. Most of the game surviving in the area is small and there are no large fish to be found in the mountain streams. Small marsupials such as the cuscus, bandicoot and, more rarely, the land wallaby, together with flying foxes and birds are the main sources of animal protein. Nets and hunting spears are generally used to catch these animals after they have been flushed out by the hunter's dog. Traps are seldom set for game but we were told this formerly was a more common technique. Snares for the smaller types of animal are often made by boys and one or two of the men. Two members of the sample owned licensed shotguns and these were very effectively and economically used. One of these men would place his services at the disposal of anyone who supplied cartridges for the gun; the other allowed a limited circle of people to use his gun. The guns were frequently used for hunting at night in the dry weather during our survey.

226 Neither of the two forms of concerted hunting common among other Orokaiva (the drive towards a pig net and grassburning, Williams 1930:45) is practised to any extent as there are few wild pigs and little grassland in the area.

Spears and fine-mesh nets are used in local streams to catch eels and the 7 types of small fish found. This task is shared by men and women usually when the water is low during a period of dry weather. They may search for fish with a net along the Sohu River wherever it passes through land held by a member of the village, but the small rock dams built by a man to form pools suitable for the use of the spear are made only where the river passes through his own land.

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[1] This requirement is 2.2 acres per capita. Barrau (1958:75) says that 2.5 to 5 acres per capita are sufficient for this type of agriculture in Melanesia, assuming the average area of garden is 0.25 acres and that the duration of bush fallow ranges from 10 to 20 years. In March 1951, 40 square miles of unrestricted land were considered suitable for resettling 4,500 of the survivors of the recent eruption (Plant 1951:4; Belshaw 1951:9). It was felt that these 5 acres per capita were enough only to meet the immediate requirements of traditional subsistence gardening for the next few years. (It was well-wooded and appeared 'most productive' and easily accessible by road.) Considerable population increases were anticipated.

241 423 [613] that is then cultivated contiguously,[1] while in the high density areas there is a tendency towards a more individual pattern of exploitation.[2] Short-term rights to land for the non-lineage members are frequently granted (on a reciprocal basis), sometimes to facilitate contiguous cultivation or to compensate for inadequate landholdings. This pattern is promoted by the high degree of [425] fragmentation of individual holdings. Further to this, Rimoldi (1966:62, 95) observes that plots are often permanently transferred outside the direct patrilineal line, and this applies equally to [578] land under both cash and subsistence crops. In the Inonda area, however, Crocombe and Hogbin (1963:73-5) observe that there is considerable reluctance to plant, or make land available for planting cash crops if the land has not been acquired patrilineally, for fear of subsequent disputes. Thus the tenurial situation may be of considerable significance in the development of cash cropping.

245 428 Traditional tree crops are not planted in stands or groups like cash crop trees, but are widely scattered and may equally well be planted on patrimonial land or on land of affines or matrilateral kin. Inheritance of rights to trees usually does not involve rights to the land on which they stand. However, owing to their wide spacing, their presence rarely seriously affects other cultivation of the land.

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[1] The decision-making process has not been investigated but it appears that there is no institutionalised position relating to land matters. An exception is provided by the Yega of the Gona census division who recognise a 'land custodian' (see Dakeyne 1965:35).

[2] It is possible that this is an expression of the fact that sufficiently large areas of suitable secondary forest are not available at any one time to permit contiguous cultivation. Two other factors are that in low density areas wild pigs and other animals necessitate the fencing of gardens, a task which is easier for contiguous groups than for individuals, and that in forest much wider fringe clearing is necessary than in low second growth. The volume of fringe clearing per garden is much reduced if gardens are contiguous.

[311] [136] [417]

433 [184] settlements have access to garden land, hunting and foraging areas and creeks but there are considerable variations in availability of these resources, and others such as fish and potting clay. These variations are expressed in the relative significance of the different elements in the work and exchange patterns of different communities.

592 Within the community, the household is the principal economic unit, aiming at self-sufficiency in terms of procuring food, shelter, clothing and production equipment.[1] Thus, gardens are the responsibility of individual households, and the work group for any activity, including clearing and harvesting, seldom exceeds its adult members. [438] Each household produces its own digging-sticks, spears, building [476] materials, sleeping-mats, etc., but axes, bush knives, cooking utensils and clothing are usually obtained from trade stores. For most phases of production co-operation between households is of little importance.

241 A household may maintain between one and five gardens, three being the mean. These average 0.3 acres in size and are generally between five and twenty-five minutes' walk from the village. In some areas, including Inonda and the Yega area, it has recently become popular to plant kitchen gardens adjacent to the houses, often containing manioc, sweet potato, cucurbits, pineapple and even taro. Banana, coconut, breadfruit and 'hingi' (betel pepper) trees are often planted at random around the periphery of the village and in the village square.

The process of garden preparation has been described in the articles cited above.[2] When all but the largest trees have been felled, most of the debris is burned and the remainder piled around the tree stumps. There is no preparation of the soil and crops are planted with the aid of a digging-stick. Gardens are weeded regularly in the early stages, but less frequently as they approach [417] maturity. In the less densely settled areas where wild pigs are [136] common, such as Inonda, most gardens need to be fenced; when separate households have contiguous gardens they usually fence them simultaneously and help each other in this more often than in any other garden task.

[262] The staple food plant of the Orokaiva is taro (Colocasia) and comparatively small areas are planted with the subsidiary root crops of sweet potato, yams, 'German' taro (Xanthosoma) and manioc. Interplanted with the ground crops are large herbs and trees, such as

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[1] Exceptions occur in the case of the elderly or infirm, who are often supported by an offspring's household, and so frequently live in a house adjacent to one or more of them (see Map 4).

[2] See p.23.

A,[See Category 102, p.38--Analyst]

241 cultivators in New Guinea.[1] This was due partly to changing emphases in the pattern of work between the two surveys, particularly the greater amount of time used for external agencies and in the inception of two communal enterprises (the establishment of a cash crop garden and preparations for the transfer of the village to a new site). Three other factors must be taken into account. [125] Firstly, a slightly different survey technique was employed by Rimoldi. The 1964 measurements were confined to a single point in time, whereas Rimoldi measured all the gardens and then added any extensions which occurred during the survey period (about six weeks) without deducting any areas which might have gone out of [132] production. Secondly, 1964 proved to be a highly unseasonal year at Sivepa in that recorded rainfall in August exceeded that in December (1,542 and 1,416 points respectively) and the number of rain days was the same in each month (24). This disrupted the cycle of agricultural activities and prevented the customary clearing of forest for new gardens during dry weather. For this reason, figures for areas planted but not producing (see Table 4:1) approximate closely to Rimoldi's, whereas cleared and producing areas fall far short.[2] Thirdly, two household heads within the group surveyed in 1964 had been absent from the village for two to three months before the data were collected, and third's activities were partially diverted by his involvement in a contract to build a house at Saiho hospital, and most of the community were involved for several weeks in building the new road to Sasembata and in erecting classrooms on the mission station.

245 (b) Economic trees and livestock

The holdings of economic trees (Table 4:3) indicate their importance for subsistence. Breadfruit comprises a very large proportion of the intake of starches at the onset of the dry season and only when most of it has been harvested do the people resort to sago-making. Areca is chewed by almost all adults, while the milk of the green coconut is drunk as refreshment and the meat grated to use in preparing staple foods. Hauga (Canarium sp.) nuts, when in season, are gathered and consumed largely by children.

[136] All economic trees, except for the recently introduced orange, grow wild in the bush but are claimed as individual property. Several, particularly coconut, areca palms and hingi trees, are also planted in gardens and on the periphery of the village.

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[1] See Barrau 1958:32; Brookfield 1962:245, 251; Bureau of Statistics 1963:14.

[132] [2] Similarly, a long unseasonal dry spell occurred during the last few weeks of Rimoldi's survey with the consequent extensive clearing of land for new gardens.

244 Breadfruit trees grow around the village and in garden areas, some being planted and others self-sown but preserved when garden sites are cleared. All are individually owned. Harvesting is relatively easy, the fruit being removed from the tree with the [262] aid of a knife attached to a long stick. Sago apart, the breadfruit comprises a major element of diet during the dry months.

433 While the inland Orokaiva are essentially food-gardeners - a fact dictated largely by the density of occupation where intensive [224] utilisation of the forest has greatly reduced its plant and animal [512] resources - both hunting and sago-making are of limited importance and occupy 1.8 and 0.4 hours per man-week respectively.

224 Traditionally the Sivepe people claim to have hunted feral pig high on the slopes of Mt Lamington but this has ceased now they [136] 'have too much to do'. No such pigs are found in the bush adjacent to the village but bandicoot, wallaby, cus-cus, flying fox, and a variety of birds are not uncommon. Periodically domestic pigs [411] enter gardens whereupon they are usually hunted out and killed, either by the irate gardener or the owner of the animal. While a spear may be used in the latter case, shotguns are now often used or special hunting parties organised where a net is employed. Use of the two shotguns held in the village is usually confined to the owner and others who contributed to its purchase. Such hunting, with the aid of a torch, is normally done on moonlit nights and is most common in the dry season when flying fox are attracted to the ripe breadfruit.

[512] During the survey, however, most hunting was done during period III when 4.8 hours per man-week were recorded, the avowed object being to 'stockpile' smoked meat for the annual Christmas feast held on Sasembata mission station. Large intra- and inter-village group drives were organised daily for two weeks, the activities being initiated by the priest blessing the dogs. Wallabies were the principal animals caught. During both weeks time spent hunting exceeded 11 hours per man-week, or more than that devoted to taro gardening. These drives were facilitated by a spell of unusually 223 dry weather.
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Sago-making is a highly seasonal activity. In Sivepe, production [221] is confined primarily to the dry season when 1.3 hours per man-week [512] were spent on it, rising to 6.4 hours in week 16 when only taro [461] gardening, among subsistence activities, was of greater importance. The work is arduous and is only undertaken with reluctance as the flour must be produced as quickly as possible following the felling of the tree. It is one of the few activities not interrupted by heavy rain.

[461] Because of the very high labour requirements, sago-making is essentially a group enterprise and, not being popular, is only commenced when a number of families have little producing food in their

[TEXT CONTINUED ON PAGE 87]

311 products, such as slow-growing trees, which are used for house
423 posts, drums, and other artifacts. A great deal of Sivepo land is in young bush but this is fallowed garden land. After eight years or so, it grows sizeable trees, and sometimes it is fallowed for much longer. In this bush, many trees may be found that have actually been planted by man and are owned by individuals. Prominent among these are breadfruit, various nut trees, fruit trees and trees with other specific uses. Some of these are
224 deliberately planted in bush. People go to the bush to collect
[222] these, to forage and to hunt. Although hunting expeditions do occur periodically, and cause much excitement, they yield very
[136] little meat. Not only is the area too small to contain much game, but also it appears that very few birds and no game apart from
[411] small marsupials are actually still left. The same is true for the rivers which contain very little fish. I could not help wondering, in fact, whether the meat collected was an adequate
[262] return for the number of cartridges used to kill it. Hunting expeditions occurred only when there was a feast, and when the offering of fresh meat to guests was especially desirable. (Tinned meat might be cheaper than the cartridges but much less esteemed.)

311 In this respect, the situation was very different in Inonda where only a fraction of the land was used for gardening so that almost all of it was hunting land. Most of this was in kunai grass, which was very often burnt over. The effect of these burnings was very often that good garden land also fell a victim to fire,
224 valuable trees were destroyed and villages endangered. The yield
223 in meat was much higher, however, so that in Inonda, meat actually became an economic resource: it was sold on the market and used as gifts in return for feathers and other valuables. There are more birds at Inonda than at Sivepo, more marsupials and also a good chance of an occasional wild pig. Neither at Sivepo nor at Inonda is there evidence today of the use of traditional hunting techniques, though traditional fishing techniques have survived.
[411] The decline in game and fish population is ascribed to the intro-
[273] duction of guns and snorkels which greatly increased yields for
[199] some years, but then led to a greater scarcity than had ever been known in the past. Guns and snorkels were introduced shortly after the second world war.

There are two kinds of domestic livestock: pigs and fowls.
231 The number of pigs has, as I already pointed out, declined greatly in both villages. It was impossible to know how many pigs were owned by Sivepo people in 1966-67, because they disappeared as the old village became deserted and were never seen at all in the new village. Rimoldi reports 24 pigs owned by his sample of 50 Sivepo people alone which suggests that even in 1963, when he stayed there, the whole village must have owned at least 60. During my period of study, only a few of them were killed, and only when